



Sunspot Index and Long-term Solar Observations

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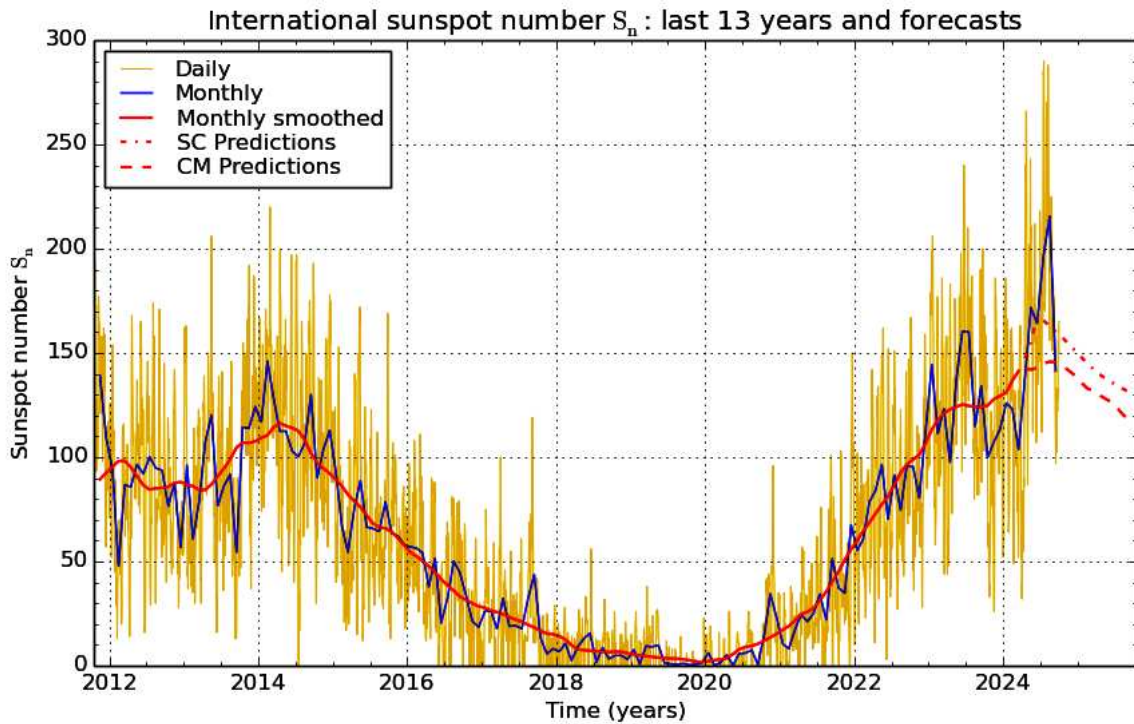
SUNSPOT BULLETIN

2024 n° 09

Provisional international and normalized hemispheric daily sunspot numbers for September 2024

Computed at the *Royal Observatory of Belgium* using observations from an international network with the *Specola Solare Ticinese Locarno* as reference station.

Date	S_n	$S_n(N)$	$S_n(S)$
1	168	37	131
2	182	42	140
3	175	29	146
4	171	15	156
5	171	15	156
6	177	19	158
7	170	17	153
8	157	35	122
9	151	45	106
10	141	58	83
11	147	52	95
12	132	42	90
13	109	33	76
14	107	30	77
15	97	22	75
16	132	34	98
17	133	37	96
18	102	22	80
19	105	25	80
20	115	36	79
21	124	50	74
22	131	53	78
23	122	35	87
24	133	29	104
25	128	29	99
26	136	28	108
27	156	34	122
28	155	35	120
29	149	25	124
30	165	33	132
Monthly mean	141.4	33.2	108.2
Cooperating stations	63	57	57



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium 2024 October 1

Predictions of the monthly smoothed Sunspot Number
 using the last provisional value, calculated for March 2024: 141.3 ($\pm 5\%$)

	SM	CM		SM	CM		SM	CM
2024 Apr	148	143	2024 Oct	158	144	2025 Apr	140	130
May	156	142	Nov	154	142	May	138	128
Jun	168	143	Dec	151	139	Jun	136	126
Jul	166	145	2025 Jan	148	136	Jul	134	123
Aug	163	146	Feb	145	133	Aug	133	120
Sep	160	146	Mar	142	132	Sep	131	119

SM : SIDC classical method : based on an interpolation of Waldmeier’s standard curves. The estimated error ranges from 7% (first month) to 35% (last month)

CM : Combined method : the combined method is a regression technique coupling a dynamo-based estimator with Waldmeier’s method of standard curves, designed by K. Denkmayr.

Ref.: K. Denkmayr, P. Cugnon, 1997 : “About Sunspot Number Medium-Term Predictions”, in “Solar-Terrestrial Prediction Workshop V”, eds. G.Heckman et al., Hiraiso Solar Terrestrial Research Center, Japan, 103.

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Summary of the URSIGRAMs from S.I.D.C.

Date	S _n	PPSI	600	2800	COS	SFI	XI	Ak
31	176	80	-	232	////	7	3/0	26
1	168	77	-	238	////	8	0/0	19
2	182	77	-	238	////	3	5/0	8
3	175	110	-	262	////	17	2/0	5
4	171	108	-	262	////	19	6/0	15
5	171	97	-	241	////	5	6/0	4
6	177	89	-	249	////	12	0/0	7
7	170	92	-	222	////	31	1/0	8
8	157	61	-	228	////	12	1/0	9
9	151	78	-	215	////	100	6/0	10
10	141	81	-	205	////	23	1/0	8
11	147	64	-	207	////	120	4/0	12
12	132	61	-	201	////	28	4/0	52
13	109	45	-	186	////	9	5/0	32
14	107	53	-	172	////	106	1/1	17
15	97	42	-	173	////	12	0/0	18
16	132	43	-	170	////	3	0/0	17
17	133	47	-	165	////	0	0/0	54
18	102	50	-	163	////	2	0/0	12
19	105	45	-	161	////	3	0/0	16
20	115	53	-	154	////	1	0/0	7
21	124	69	-	158	////	2	0/0	7
22	131	50	-	163	////	105	1/0	5
23	122	41	-	167	////	2	1/0	15
24	133	50	-	172	////	5	0/0	14
25	128	37	-	174	////	12	1/0	25
26	136	35	-	181	////	14	1/0	15
27	156	39	-	186	////	13	0/0	6
28	155	40	-	195	////	10	0/0	8
29	149	50	-	197	////	15	2/0	16
30	165	56	-	214	////	18	0/0	11

S_n : provisional international sunspot numbers from the S.I.D.C.

PPSI : prompt photometric sunspot index from the S.I.D.C. in 10^{-5} w/m² : the quantity to be subtracted from the mean solar constant to account for the sunspot contribution.

600 : 600 Mhz solar flux from the station at Humain (Belgium).

2800 : 2800 Mhz solar flux from Ottawa (origin : Ursigrams - UGEOI). The 10.7cm Flux data are a service of the National Research Council of Canada.

COS : thousands of the cosmic ray counts (origin : Ursigrams - UCOSE Terre Adélie).

SFI : Solar Flare Index from the S.I.D.C. (origin: Ursigrams - UGEOR, evaluation : $1 \times S_n + 10 \times "1" + 100 \times ">1"$).

XI : X-flares index from the Ursigrams (M-flares/X-flares) (origin: Ursigrams - UGEOR, UGEOI).

Ak : geomagnetic index from Wingst, Germany (origin: Ursigrams).

SOLAR PHYSICS DEPARTMENT

UCCLE DAILY PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR SEPTEMBER 2024

DATE	UT	NUMBER		RELATIVE SUNSPOT NUMBERS			PPSI	QUAL	OBS	
		OF GROUPS	OF SPOTS	TOTAL	NORTH	SOUTH				CENTRAL
1	1015	11	79	189	38	151	76	55.2	3	SB
2	800	9	100	190	37	153	88	78.7	4	OB
7	910	8	91	171	16	155	69	162.6	3	OB
8	1000	10	70	170	38	132	64	66.6	3	OB
9	1110	11	90	200	69	131	74	118.3	4	SB
11	1150	11	70	180	55	125	55	76.0	3	SB
12	1115	8	58	138	52	86	82	63.1	3	OB
13	800	8	52	132	38	94	50	63.0	3	OB
14	730	6	55	115	37	78	25	133.7	3	LL
15	820	5	50	100	30	70	27	123.2	4	LL
16	1420	8	62	142	37	105	0	80.1	3	SB
17	845	10	56	156	59	97	49	112.5	2	SB
18	1115	6	35	95	23	72	24	91.2	2	SB
19	835	6	48	108	28	80	41	71.6	2	SB
20	815	6	45	105	33	72	19	69.8	2	SB
21	900	7	54	124	51	73	68	131.6	3	SB
23	1140	8	52	132	36	96	26	25.2	3	OL
25	1115	7	57	127	33	94	23	43.2	2	OL
26	1125	8	62	142	13	129	24	54.8	3	OL
27	750	11	56	166	36	130	81	38.6	1	OL
28	830	9	97	187	38	149	83	49.8	3	OL
29	755	8	93	173	37	136	60	81.9	3	OL

The relative mean sunspot number is 147.4.

NORMALISED UCCLE OBSERVATIONAL SUNSPOT NUMBERS $U'=K'U$ FOR SEPTEMBER 2024

$K' = 0.930 (*)$

1	176	7	159	13	123	19	100	25	118
2	177	8	158	14	107	20	98	26	132
3	***	9	186	15	93	21	115	27	154
4	***	10	***	16	132	22	***	28	174
5	***	11	167	17	145	23	123	29	161
6	***	12	128	18	88	24	***	30	***

The normalised relative monthly mean sunspot number is 137.

(*) K' is the mean of the monthly K' for the last five years.

The Sun has been observed 22 days on 30 possible.